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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/800,773	03/08/2001	Akira Oosawa	Q61190	6412

7590 07/27/2006

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EXAMINER

DANG, DUY M

ART UNIT	PAPER NUMBER
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2624

DATE MAILED: 07/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	09/800,773		OOSAWA, AKIRA	
	<b>Examiner</b>		<b>Art Unit</b>	
	Duy M. Dang		2624	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 June 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's amendment filed on June 30, 2006 has been entered and made of record.
2. Applicant's arguments, see page 2 final two paragraphs, filed June 30, 2006, with respect to the double patent rejection of claims 1-16 have been fully considered and are persuasive. Therefore, the rejections of claims 1-16 have been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Kano et al. (U.S. Patent No. 5,359,513. Art of record, IDS filed 6/13/2001) and Jatko ("Nonlinear filter derived from topological image features" SPIE, Vol. 1295 Real-Time Image Processing II, Published in 1990, pages: 8-16).

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 10-16 are rejected under 35 U.S.C. 112, first paragraph, because of the reasons as follows:

It is noted that claim 10 recites a single means that of "image processing means" in line 1 so it is considered as a single means claim. Therefore, claim 95 is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. See MPEP 2164.08(a). Likewise, all claims 11-16 depend from claim 10 are rejected for the same reason as set forth in claim 10.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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6. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

There is insufficient antecedent basis for the following terms: “the substantial difference” recited in lines 3-4 of claim 1, and line 4 of claim 10.

All claims 2-9 and 11-16 depend from claims 1 and 10 respectively are rejected for the same reasons as above.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kano et al. (U.S. Patent No. 5,359,513. Art of record, IDS filed 6/13/2001. Referred as Kano hereinafter) in view of Jatko (“Nonlinear filter derived from topological image features” SPIE, Vol. 1295 Real-Time Image Processing II, Published in 1990, pages: 8-16. Referred as Jatko hereinafter).

Regarding claim 1, Kano teaches an image processing method for carrying out image processing on an interimage-difference image obtained by subjecting two desired images from among two or more images taken on the same subject to interimage processing and which represents the substantial difference between said two images, wherein said image processing carried out on said interim-difference image is image processing by which the substantial difference between said two images represented therein is enhanced relative to artifacts arising

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due to alignment of structural positions contained within said two images [see column 2 line 20 to column 3 line 29: note “computerized method and apparatus for enhancement and detection of lung disease” (lines 21-22 of column 2) which performs subtraction process between two images (lines 25 of column 2). Also refer to local matching technique included in image registration as shown at 43 in figure 1B: this local matching technique corresponds to the so called “alignment of structural positions”].

While Kano does not explicitly enhance difference due to the artifacts resulting from misalignment errors, Kano suggests to use post-processing i.e., filtering on the difference (subtraction of the two images) to improve image quality according to column 14 lines 1-46 (for example, see lines 1-15, 24-28, and 32-36). In addition, image enhancement by removing artifacts resulted from misalignment errors is an old and widely used method in the art of image processing. For example, Jatko’s article discloses using filter technique for processing difference image to remove artifacts resulted from misalignment/misregistration of two images according to abstract and section 2: Structural Filter (specifically page 12: figure 2, equation 7 and last paragraph).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to such filter as taught by Jatko on the difference image generated by Kano for artifacts removal in order to improve image quality for displaying as suggested by Kano as pointed out above. By doing so, it would aid the radiologists to accurately diagnose the disease.

Regarding claims 2, it recites “wherein said image processing comprises suppressing said artifacts relative to the substantial difference between said two images.” The rejection of claim 1 above is applicable to this claim.

Regarding claim 3, it recites “wherein suppression of said artifacts relative to the substantial difference between said two images comprises performance of image processing based on morphology process utilizing structural elements larger than said artifacts and smaller than said substantial difference.” These claimed features is satisfied by Jatko’s article, page 12 last paragraph to page 14 first paragraph and figure 4: as seen the erosion filter in the first operation will remove artifacts that are smaller than the kernel.

Regarding claim 4, it recites “wherein said image processing comprises emphasizing the substantial difference between said two images relative to artifacts.” These claimed features are satisfied by applying filter technique for removing artifact from difference image according to the combination of Kano and Jatko as discussed above with regard to claim 1.

Regarding claim 5 (5/1, 5/2, 5/4), it recites “wherein said interimage processing comprises subtraction of corresponding structural positions within said two images.” These claimed features are satisfied by Kano’s column 2 lines 20-28: note image registration technique.

Regarding claim 6, it recites “wherein said interimage processing comprises subtraction of corresponding structural positions within said two images.” The rejection of claim 5 above is applicable to this claim.

Regarding claim 7 (7/1, 7/2, 7/4), it recites “wherein said two images are radiation images taken of the same subject at different points in time in a time series manner.” These claimed features are met by Kano’s column 5 lines 1-5 that of “interval change ...temporal sequential chest images...radiograph images.”

Regarding claim 8, it recites “wherein said two images are radiation images taken of the same subject at different points in time in a time series manner”. The rejection of claim 7 above is applicable to this claim 8 and claim 9 (9/5/1, 9/5/2, 9/5/4) as well.

Regarding claim 10, it is noted that this claim is an apparatus claim reciting similar features called for in method claim 1 above. Thus, the rejection of claim 1 above is incorporated herein.

Regarding claim 11, it recites “wherein said image processing procedure comprises suppressing said artifacts relative to the substantial difference between said two images.” The rejection of claim 2 above is applicable to this claim.

Regarding claim 12, it recites “wherein said image processing procedure comprises suppressing said artifacts relative to the substantial difference between said two images by applying image processing based on a morphology process utilizing structural elements larger than said artifacts and smaller than said substantial difference.” The rejection of claim 3 above is applicable to this claim.

Regarding claim 13, it recites “said image processing procedure comprises emphasizing the substantial difference between said two images relative to the artifacts.” The rejection of claim 4 above is applicable to this claim.

Regarding claim 14 (14/10, 14/11, 14/12, 14/13), it recites “wherein said interimage processing procedure comprises subtraction of corresponding structural positions within said two images.” The rejections of claims 5-6 above are applicable to this claim.

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Regarding claim 15 (15/10, 15/11, 15/12, 15/13), it recites "wherein said two images are radiation taken of the same subject at different points in time in a time series manner." The rejection of claim 7 above is applicable to this claim 15 and claim 16 as well.

***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duy M. Dang whose telephone number is 571-272-7389. The examiner can normally be reached on Monday to Friday from 6:00AM to 2:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew C. Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

dmd  
July 20, 2006



**DUY M. DANG  
PRIMARY EXAMINER**